

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



re Application of

Kazuo HATA et al

5 Serial No. 09/597,763

Art Unit: 1772

Filed: June 20, 2000

Examiner: Watkins III William P

For: CERAMIC SHEET AND PROCESS FOR PRODUCING THE SAME

DECLARATION UNDER 37. C.F.R. 1.132

10 HONORABLE COMMISSIONER OF PATENTS AND TRADEMARKS

WASHINGTON, D.C. 20231

Sir:

Now comes Norizazu AIKAWA, a citizen of Hyogo-ken, Japan, who

15 declares and states:

That I graduated from the Graduate school of engineering at Osaka Prefecture University in the year 1984.

That I have worked in Nippon Shokubai Co., Ltd. for 20 years in the field of Performance Chemicals & Materials Research Center.

20 That I have conducted the following experiments to clarify that maintaining the values of waviness, warp, Rmax of the sheet within the range defined by EP0704413, can not prevent the sheet from its cracking under load-applying test at high temperature unless the values of burr and dimple are maintained within the range  
25 defined by the present invention.

## EXPERIMENTAL REPORT

### 1. Experimental Method

Experiments regarding stacking-induced load and heat thermal of the ceramic sheet were carried out in the similar manner as Example 1 (shown as Example 1 in table 1) and Comparative Example 3 (shown as Comparative Example 1 in table 1) recited in the present specification except that the wheat flour was not used when preparing the zirconia sheet of the Comparative example 3.

And also, Experiments (shown as Examples 2-3 and Comparative Examples 2-3 in table 1) were carried out in the similar manner as Examples in EP0704413A2.

That is, the zirconia sheet of Comparative Example 2 in table 1 was prepared based on Example 1 of EP0704413A2 except that zirconia green sheet was cut in the same manner as Example 1 of the present specification using the cutter blade having a blade angle  $\theta$  of  $71^\circ$  ,  $\theta_1$  of  $35.5^\circ$  ,  $\theta_2$  of  $35.5^\circ$  .

The zirconia sheet of Example 2 in table 1 was prepared based on Example 1 of EP0704413A2 except that zirconia green sheet was cut in the same manner as Example 1 of the present specification using the cutter blade having a blade angle  $\theta$  of  $57.5^\circ$  ,  $\theta_1$  of  $26.5^\circ$  ,  $\theta_2$  of  $31^\circ$  . And as described in Example 2 of the present specification, corn starch was sprinkled onto the porous sheet and was uniformly flattened with a blush.

The zirconia sheet of Comparative Example 3 in table 1 was prepared based on Example 8 of EP0704413A2 except that zirconia green sheet

was cut in the same manner as Example 1 of the present specification using the cutter blade having a blade angle  $\theta$  of  $71^\circ$ ,  $\theta_1$  of  $35.5^\circ$ ,  $\theta_2$  of  $35.5^\circ$ . And the number of green sheets prepared by this example was 3 sheets.

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The zirconia sheet of Example 3 in table 1 was prepared based on Example 8 of EP0704413A2 except that zirconia green sheet was cut in the same manner as Example 1 of the present specification using the cutter blade having a blade angle  $\theta$  of  $57.5^\circ$ ,  $\theta_1$  of  $26.5^\circ$ ,  
10  $\theta_2$  of  $31^\circ$ . The number of green sheets prepared by this example was 3 sheets. And as described in Example 2 of the present specification, corn starch was sprinkled onto the porous sheet and was uniformly flattened with a blush.

15 The values of maximum burr height, dimple height, waviness height, and load-applying test( $1000^\circ\text{C}$ ) of each sheet were measured by the same method of the present specification (see experiment of the present specification). The values of warp, Rmax, and load-applying test( $25^\circ\text{C}$ ) were measured by the same method of  
20 EP0704413.

## 2. Experimental Results

See [table 1] attached herewith

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## 3. Consideration

As a result of the experiments, even the values of waviness, warp, Rmax of the sheet were within the range defined by EP0704413, crack of the sheet under load-applying test at  $1000^\circ\text{C}$  could not be

suppressed as shown in the results of comparative examples 1-3 unless the values of maximum burr height and dimple height were maintained within the range defined by the present invention as shown in the results of the examples 1-3.

The undersigned Petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

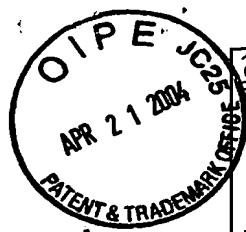
4. Further declarant saith not.

Respectfully submitted

Date: April 6, 2004

Norikazu Aikawa

Norikazu AIKAWA



[table 1]

	maximum burr height ( $\mu$ m)	dimple height ( $\mu$ m)	waviness height ( $\mu$ m)	warp (%)	R max ( $\mu$ m)	Load-applying test (1000°C) 0.1kgf/cm <sup>2</sup>	Load-applying test (25°C) 0.1kgf/cm <sup>2</sup>
Example 1	27	30	40	0.06%	0.8	10 times : no cracking	0 per 10 sheets : 0%
Comparative Example 1	126	140	100	0.08%	0.6	6 times : cracking	0 per 10 sheets : 0%
Comparative Example 2	136	105	20	0.01%	0.8	8 times : cracking	0 per 20 sheets : 0%
Example 2	47	32	25	0.01%	0.7	10 times : no cracking	0 per 20 sheets : 0%
Comparative Example 3	117	172	30	0.08%	4	6 times : cracking	0 per 5 sheets : 0%
Example 3	40	43	35	0.08%	3	10 times : no cracking	0 per 5 sheets : 0%